

ADLINK Technical Document

Abstract	How to use Digitizer in MATLAB		
OS	Windows		
Keyword	MAPS, Digitizer, WD-DASK		
Related Products	PCIe-9814, PCIe-9834, PXIe-9834, PCIe-9842, P PCIe-9852, PXIe-9852, PCI-9816, PCI-9826, PCI- PXI-9846, PCI-9820	XIe-984 -9846, F	2, PXIe-9848, XI-9816, PXI-9826,
Date	2021-07-30	No.	202110007

• Overview:

The DAQ module requires a third-party compiler installed on your system to control the DAQ card from MATLAB® correctly. This document outlines the compiler setup process and how to download sample code for MATLAB.

NOTE: The MathWorks® Data Acquisition Toolbox[™] is widely used to connect to data acquisition hardware and read data into MATLAB (also a MathWorks product). ADLINK does not provide this tool, so it requires an alternative compiler to install the DLLs needed to control the DAQ card with MATLAB.

• Prerequisites:

Install MAPS Core or WD-DASK.

• Solution:

The steps below show how to set up the correct environment and use the code samples in MATLAB.



Step 1:

Go to this link: <u>http://www.mathworks.com/support/sysreg/previous_releases.html</u>

Step 2:

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In the "Release" column, locate the MATLAB version installed on your system.

Release		Windows	Linux	Mac	Solaris/UNIX	Supported Compilers	Platform Availability
R2021a (MATLAB 9.10)		Details	Details	Details	N/A	Details	Details
R2020b (MATLAB 9.9)		Details	Details	Details	N/A	Details	Details
R2020a (MATLAB 9.8)		Details	Details	Details	N/A	Details	Details
R2019b (MATLAB 9.7)		Details	Details	Details	N/A	Details	Details
R2019a (MATLAB 9.6)		Details	Details	Details	N/A	Details	Details
R2018b (MATLAB 9.5)		Details	Details	Details	N/A	Details	Details
R2018a (MATLAB 9.4)		Details	Details	Details	N/A	Details	Details
R2017b (MATLAB 9.3)		Details	Details	Details	N/A	Details	Details
R2017a (MATLAB 9.2)		Details	Details	Details	N/A	Details	Details
R2016b (MATLAB 9.1)		Details	Details	Details	N/A	Details	Details
R2016a (MATLAB 9.0)		Details	Details	Details	N/A	Details	Details
R2015b (MATLAB 8.6)	·	Details	Details	Details	N/A	Details	N/A

Previous Releases: System Requirements and Supported Compilers

Step 3:

In the "Supported Compilers" column, click the "Details" link in the row corresponding to your MATLAB version.

Release	Windows	Linux	Mac	Solaris/UNIX	Supported Compilers	Platform Availability	
R2021a (MATLAB 9.10)	Details	Details	Details	N/A	Details	Details	
R2020b (MATLAB 9.9)	Details	Details	Details	N/A	Details	Details	
R2020a (MATLAB 9.8)	Details	Details	Details	N/A	Details	Details	
R2019b (MATLAB 9.7)	Details	Details	Details	N/A	Details	Details	
R2019a (MATLAB 9.6)	Details	Details	Details	N/A	Details	Details	
R2018b (MATLAB 9.5)	Details	Details	Details	N/A	Details	Details	
R2018a (MATLAB 9.4)	Details	Details	Details	N/A	Details	Details	
R2017b (MATLAB 9.3)	Details	Details	Details	N/A	Details	Details	
R2017a (MATLAB 9.2)	Details	Details	Details	N/A	Details	Details	
R2016b (MATLAB 9.1)	Details	Details	Details	N/A	Details	Details	
R2016a (MATLAB 9.0)	Details	Details	Details	N/A	Details	Details	
BOOLEL (MATLAD O.C.)	Datalla	Dataila	Datalla	N17.6	Datalla	617A	

Previous Releases: System Requirements and Supported Compilers

Step 4:

Install a recommended compiler according to your MATLAB version.

	MATLAB	Compiler	EX	NE	JA	Coder	SimBiology	Designer
	For MEX- file compilation and external							
Compiler	usage of MATLAB Engine and MAT-file APIs	For C and C++ shared libraries	For all features	For all features	For all features	For all features	For accelerated computation	For accelerated computation
Icc-win32 v2.4.1 Included with MATLAB	Ś					ø :	×	×
Microsoft Windows SDK 7.1 Available at no charge; requires .NET Framework 4.0	~	~	V	* :		V :	~	*
Microsoft Visual C++ 2012 Professional	<i>~</i>	~	V	ø.		~	 Image: A set of the set of the	<i>~</i>
Microsoft Visual C++ 2010 Professional SP1	V	ø	ø	ø.		V	V	\$
Microsoft Visual C++ 2008 Professional SP1 1	Ś	~	Ś	ø.		\$	 Image: A set of the set of the	Ś
Intel C++ Composer XE 2013 °	Ś							

Step 5:

Install the compiler if not installed already. In this case, Visual Studio 2010.







Step 6:

Launch MATLAB. Enter the "mex -setup" command to begin the default compiler setup process. Press "y" to automatically locate the installed compiler.

>> mex -setup
Welcome to mex -setup. This utility will help you set up
a default compiler. For a list of supported compilers, see
http://www.mathworks.com/support/compilers/R2013b/win64.html
Please choose your compiler for building MEX-files:
fx Would you like mex to locate installed compilers [y]/n?

Step 7:

A numbered list of available compilers is displayed. Type the number of the preferred compiler, e.g., "1". Press "y" to confirm.

```
Would you like mex to locate installed compilers [y]/n? y
Select a compiler:
[1] Microsoft Visual C++ 2010 in C:\Program Files (x86)\Microsoft Visual Studio 10.0
[2] Microsoft Visual C++ 2008 SP1 in C:\Program Files (x86)\Microsoft Visual Studio 9.0
[0] None
[0] None
Compiler: 1
Please verify your choices:
Compiler: Microsoft Visual C++ 2010
Location: C:\Program Files (x86)\Microsoft Visual Studio 10.0

fx Are these correct [y]/n? y
```



Step 8:

Check the results after the updates are complete.

Trying to update options file: C:\Users\TEST\AppData\Roaming\MathWorks\MATLAB\R2013b\mexopts.bat From template: C:\PROGRA~1\MATLAB\R2013b\bin\win64\mexopts\msvc100opts.bat

Done . . .

Step 9:

Download additional ADLINK MATLAB samples from the link below.

Link: https://ftp.adlinktech.com/daq/wd_dask_matlab.zip





Step 10:

Extract the contents of the zip file to a folder. To set up this new folder in MATLAB:

- 1. Open *setpath*
- 2. Click "Add Folder"
- 3. Select the folder in the MATLAB search path area
- 4. Click "Save"

The M file in the selected folder is now accessible from within MATLAB.

	§ Community	
Layout Set Path Help	request Support	
	Add-Ons 👻	
ENVIRONMENT	RESOURCES	
📣 Set Path	-	
All changes take effect immediat	ely.	
	MATLAB search path:	
Add Folder	D:\temp\PCI_9816	^
Add with Subfolders	C:\Users\TEST\Documents\MATLAB	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\testframework	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\demos	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\graph2d	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\graph3d	
14 · · · · ·	C:\Program Files\MATLAB\R2013b\toolbox\matlab\graphics	
iviove to Top	C:\Program Files\MATLAB\R2013b\toolbox\matlab\plottools	
Move Up	C:\Program Files\MATLAB\R2013b\toolbox\matlab\scribe	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\specgraph	
Move Down	C:\Program Files\MATLAB\R2013b\toolbox\matlab\uitools	
	C:\Program Files\MATLAB\R2013b\toolbox\local	
Move to Bottom	C:\Program Files\MATLAB\R2013b\toolbox\matlab\optimfun	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\codetools	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\datafun	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\datamanager	
	C:\Program Files\MATLAB\R2013b\toolbox\matlab\datatypes	~
Remove	<	>
	Save Close Revert Default	Help





Step 11:

View the contents of the sample M file through the Editor. Modify the contents for your test if necessary. The contents of the sample M file are shown below.

📝 Editor	- D:\temp\PCI_9816\PCI_9816_AI_DMA.m	- (n x					
EDITOR	R PUBLISH VIEW) ¢ 🗗	2 🖸 🛣					
New Ope	I → Find Files I → Compare → EDIT NAVIGATE FILE → Print → EDIT NAVIGATE Breakpoints Run Run and Advance BREAKPOINTS SILIN	un Section dvance	Run and Time					
PCI_98	16_AI_DMA.m 🗶 +							
34 -	TimeBase = WDDASK.WD_IntTimeBase;%WD_IntTimeBase		<u> </u>					
35 —	ConvSrc = WDDASK.WD_AI_ADCONVSRC_TimePacer;%WD_AI_ADCONVSRC_Ti	mePacer						
36 -	SyncMode = WDDASK.ASYNCH_OP;%async							
37 -	AdRange = WDDASK.AD_B_1_V;							
38 -	Channel = uint16(0);							
39 -	<pre>TrigMode = WDDASK.WD_AI_TRGMOD_POST;%WD_AI_TRGMOD_POST</pre>							
40 -	<pre>TrigSrc = WDDASK.WD_AI_TRGSRC_SOFT;%WD_AI_TRGSRC_SOFT</pre>							
41 -	TrigPol = WDDASK.WD_AI_TrgNegative;%WD_AI_TrgNegative	TrigPol = WDDASK.WD_AI_TrgNegative;%WD_AI_TrgNegative						
42 -	anaTrigchan = uint16(0);							
43 -	anaTriglevel = 0.0;							
44 -	postTrigSCans = uint32(0);							
45 -	preTrigSCans = uint32(0);							
46 -	trigDelayTicks = uint32(0);							
47 -	reTrgCnt = uint32(1);							
48 -	<pre>modeCtrl = WDDASK.DAQSTEPPED;%DAQSTEPPED</pre>							
49 -	Al_ReadCount = uint32(102400);							
50	<pre>%butter = zeros(1,AI_ReadCount, 'uint16');</pre>							
51 -	volts = zeros(1,AI_KeadCount, 'double');							
52 -	PYOID_IIMEBASE = WDDASK.PYOID_TIMEBASE;	P9816_TIMEBASE = WDDASK.P9816_TIMEBASE;						
50 -	Scanintry = uints2(1); Scan Later = $\min \{22(1)\}$;							
55	Sampinery = 0int52(1); Sampinery = dent52(1);							
35 - K	sampierate = douoie(ryoio_limEBASE/Sampintiv);		>					
Click and d	rag to move PCI_9816_AI_DMA.m script	Ln 32	Col 33					





Step 12:

Type the filename to run the M file, e.g., "PCI_9816_AI_DMA.m", at the MATLAB command window prompt. The result is shown below. The card worked correctly and returned the data into MATLAB.



